VOICECOM TELEPHONE SYSTEM

User Manual

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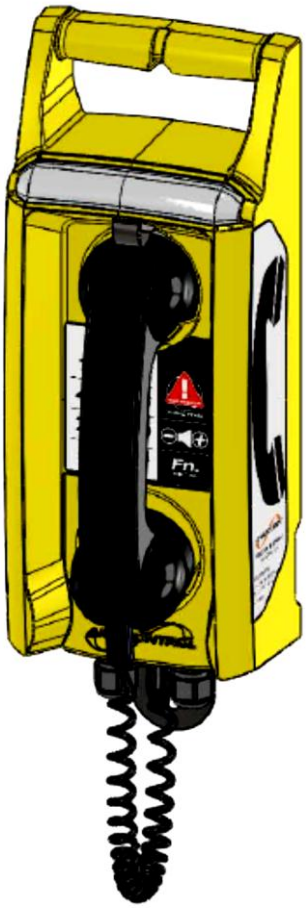
Designed and manufactured in Australia by Ampcontrol Pty Ltd



AMPCONTROL®

WARNING!	**This safety alert symbol identifies important safety messages in this manual and indicates a potential risk of injury or even death to personnel. When you see this symbol, be alert, your safety is involved, carefully read the message that follows, and inform other operators.**

CAUTION!	**This safety alert symbol identifies important information to be read in order to ensure the correct sequence of work and to avoid damage or even destruction of the equipment, and reduce any potential risk of injury or death to personnel.**

	Supplementary information not directly affecting safety or damage to equipment. Carefully read the message that follows, and inform other relevant personnel.

	Information concerning possible impact on the environment and actions required for prevention and proper response.

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Before You Begin

We would like to take a moment to thank you for purchasing the Ampcontrol Intrinsically Safe Telephone System.

WARNING!	**To become completely familiar with this equipment and to ensure correct operation, we strongly recommend that you take the time to read and thoroughly understand this user manual.**

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1 SAFETY AND OTHER WARNINGS

For safety reasons, the Intrinsically Safe Telephone System must be installed, operated and serviced only by competent personnel. Read and understand this instruction manual completely before installing, operating or servicing this equipment. Failure to install or operate this instrument in accordance with the instructions contained in this manual may create hazardous operating conditions.

WARNING!	**To comply with the Conditions of Certification, ensure full serviceable life of the product, and avoid nullifying the warranty, it is essential to exercise great care with the installation, use and storage of the System components. Failure to comply with the Conditions of Certification may seriously compromise the integrity of the system and/or its components. The user must ensure that the "Conditions of Safe Use" outlined in the certificate are met or the certificate (and the I.S. rating) will not be valid.**

1.1 Safe Use of Equipment

The equipment supplied has been manufactured according to the state of the art, and designed to ensure a safe operation. The equipment may only be used within the design parameters.

The instructions within this manual must be observed as an aid towards achieving maximum safety during operation.

The owner/user is responsible for observing the following instructions:

1.1.1 Changes to Equipment

Changes in the design and modifications to the equipment are not permitted. Unauthorised changes made to the hardware or operating firmware will void the manufacturer's warranty, and may compromise the integrity of the system into which it is installed and other connected equipment.

1.1.2 Equipment Knowledge

Experience with, or understanding of, this equipment is essential for the safe installation and removal of the equipment. Therefore, in case of a question on how to safely proceed, contact Ampcontrol immediately.

1.1.3 Manual Handling

Precautions have been taken to ensure all equipment is safe to handle and free from sharp edges. However care should always be taken when handling heavy enclosures and gloves should be worn.

1.1.4 Installation

Correct operation and safety depend on the telephone system and associated equipment being installed correctly. Mechanical and or electrical installation and maintenance of plant and equipment must only be carried out by appropriately qualified personnel and must be tested thoroughly prior to operation.

1.1.5 Operation

As safety depends on the I.S. Telephone System functioning correctly it is highly recommended that all safety functions of the system be periodically tested to ensure correct operation.

2 RECEIVING AND STORAGE

2.1 Receiving

All possible precautions are taken to protect the equipment against damage or losses during shipment, however before accepting delivery, check all items against the packing list or bill of lading. If there are shortages or evidence of physical damage, notify Ampcontrol immediately.

Notify Ampcontrol within 7 days (maximum) in case of shortages or discrepancies, according to the packing list. This action will help ensure a speedy resolution to any perceived problems. Keep a record of all claims and correspondence. Photographs are recommended.

Where practicable do not remove protective covers prior to installation unless there are indications of damage. Boxes opened for inspection and inventory should be carefully repacked to ensure protection of the contents or else the parts should be packaged and stored in a safe place. Examine all packing boxes, wrappings and covers for items attached to them, especially if the wrappings are to be discarded.

2.2 Inspection

Equipment that is found to be damaged or has been modified away from its published specification must not be used. Please contact Ampcontrol if the equipment is suspected to be different than that ordered or if it does not match the published specifications.

2.3 Storage after Delivery

When the equipment is not to be installed immediately, proper storage is important to ensure protection of equipment and validity of warranty.

All equipment should be stored indoors, preferably on shelves and protected from the elements.

2.4 Unpacking of Equipment

The method of packing used will depend on the size and quantity of the equipment. The following cautions should be interpreted as appropriate.

CAUTION!	**Take care when unpacking crates as the contents may have shifted during transport.**

ENVIRONMENTAL ALERT	**The disposal of packaging materials, replaced parts, or components must comply with environmental restrictions without polluting the soil, air or water.** **Ensure that any timber and cardboard used as packaging is disposed of in a safe and environmentally responsible manner.** **Where possible, dispose of all waste products i.e. oils, metals, plastic and rubber products by using an approved recycling service centre.**

3 INTRINSICALLY SAFE TELEPHONE SYSTEM OVERVIEW

Ampcontrol manufactures a range of Intrinsically Safe (I.S.) telephones and interface equipment for underground mining applications, and for use in other Group I hazardous locations. The Telephone System is approved to AS/NZS 60079 and IEC 60079 for Intrinsic Safety Category Ex ia. This allows the telephone lines and telephones to be installed in Zone 0 hazardous locations.

Interfacing equipment has the approval of the Australian Communications Authority (Suppliers Code No. N3463).

The system is comprised of an interface cabinet, auto-auto link cards, isolation barriers and telephones. The system is compatible with standard 24 to 48V Analogue Telephone Line Extensions.

The Voicecom Telephone has been designed to provide a user friendly communications solution. The enclosure is lightweight (<2kg) and IP67 rated to minimise damage to the unit. The telephone provides user customisation through programmable emergency call button, adjustable volume control and programmable quick-dial numbers.

Key Features

1. Compatible with standard telephone PABX – note that the I.S. Telephone System **requires** a PBX to provide the signalling and control for calls.
2. Robust construction
3. Easy to install with flexibility to expand system
4. Optional Push-To-Talk for noisy environments

There are two (2) configuration options depending on the number of I.S telephones you require. A stand-alone barrier can be used for a single telephone installation, or an interface cabinet can be used for applications where multiple telephones are required.

3.1 Interface Cabinet

A single interface cabinet can connect up to 120 I.S. Telephone lines, providing all of the required signal conditioning, I.S. power limitation and battery backup. Note that the interface cabinet is not stand-alone; a PABX or SIP server is required to provide call initiation and handling.

Discuss individual site requirements with Ampcontrol at the time of order.

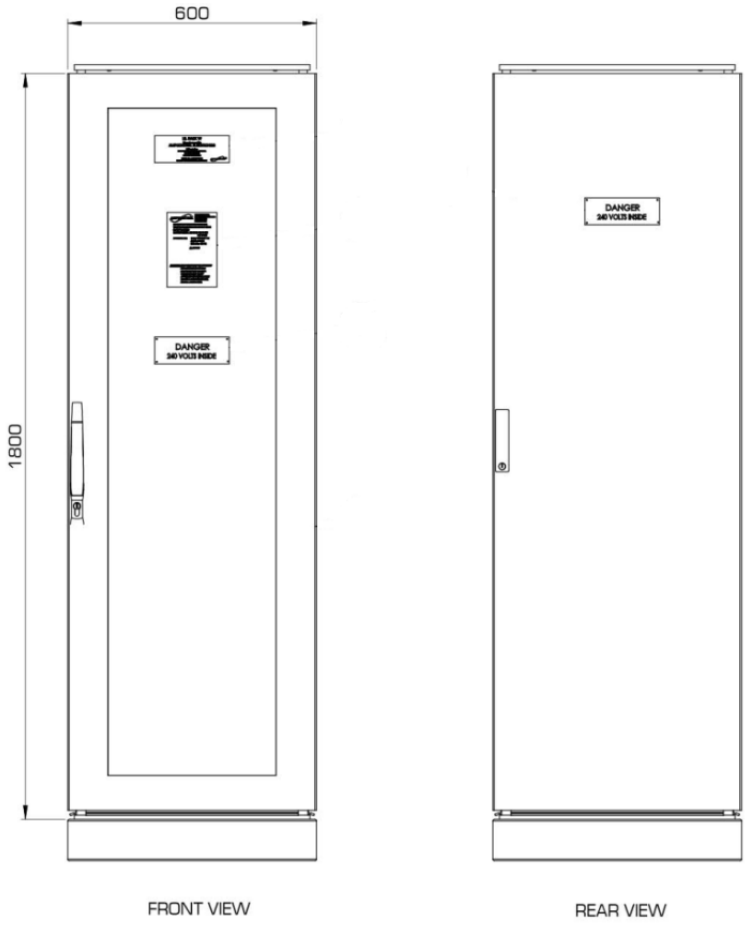


Figure 1: *Ampcontrol Interface Cabinet*

The interface cabinet consists of:

1. A battery-backed ***power supply*** with sealed, maintenance free batteries, compliant with relevant ACMA regulations. A power supply of 240VAC 50Hz is required. See section 4.3 for details.

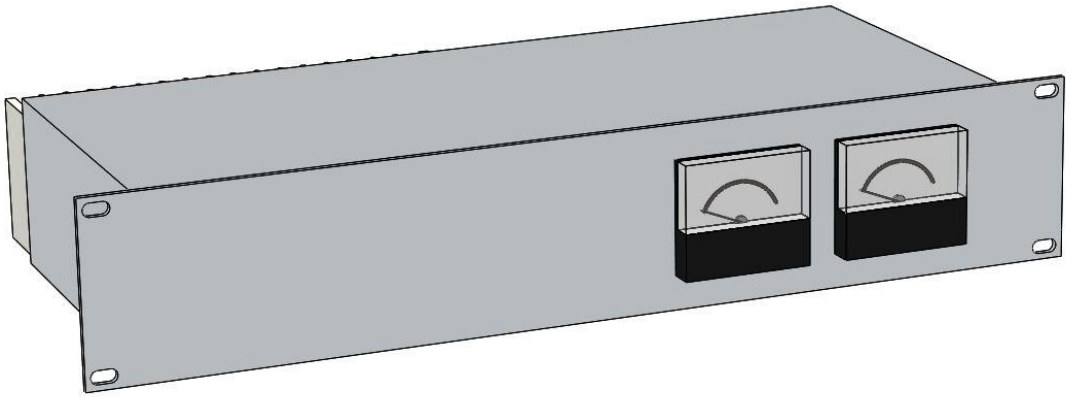


Figure 2: *Ampcontrol Interface Cabinet's Rack Mounted AC/DC Battery Charger*

2. Multiple 3RU ***shelf kits***, each able to provide the signal conditioning and I.S. barriers for 15x telephone lines via the Auto-Auto Links and NB15AC barriers. See Sections 4.1 and 4.2 for details.

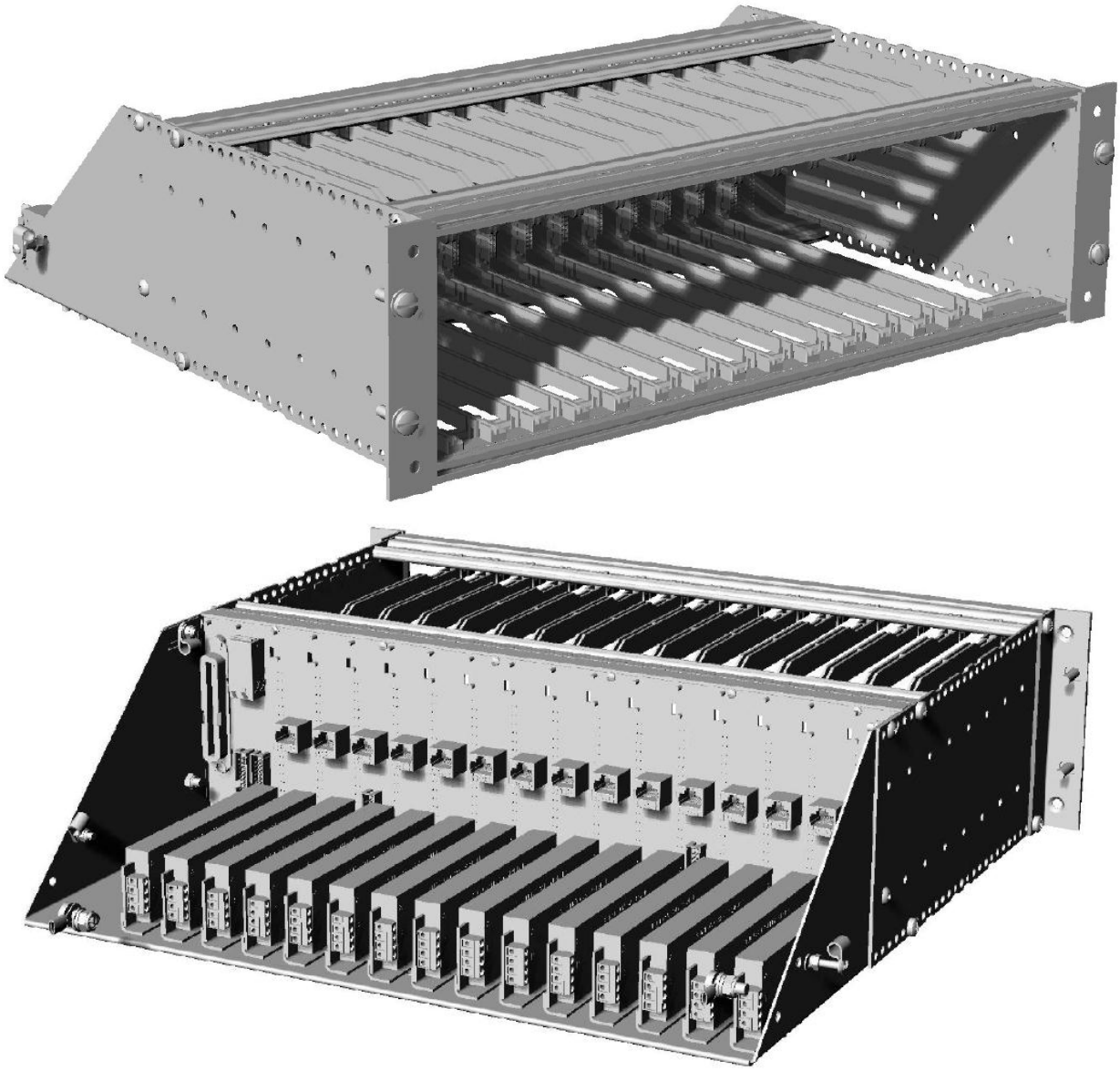


Figure 3: *Ampcontrol Interface 3RU Shelf Kit*

3. Terminals and connecting hardware. This includes the I.S. Earth terminal block, which must be connected to the supply earth by a minimum 4mm^2 earth conductor.

NOTE	**I.S. Earth connection on site should be in accordance with AS/NZS60079.25 (Intrinsically safe electrical systems) and AS/NZS60079.14 (Electrical installations design, selection and erection). See Section 12.2.4 of Part 14 for details.**

The capacity of the interface cabinet is determined by the number of shelf kits installed. For example, if 45 lines are required, 3 shelf kits will be installed (each has capacity for 15 lines). The maximum capacity of a single interface cabinet is 120 lines. It is limited to the number of shelf kits which may be installed, which is typically 8 for a standard-height cabinet.

For additional lines, additional cabinets may be installed. See Figure 4 for a typical telephone system arrangement.

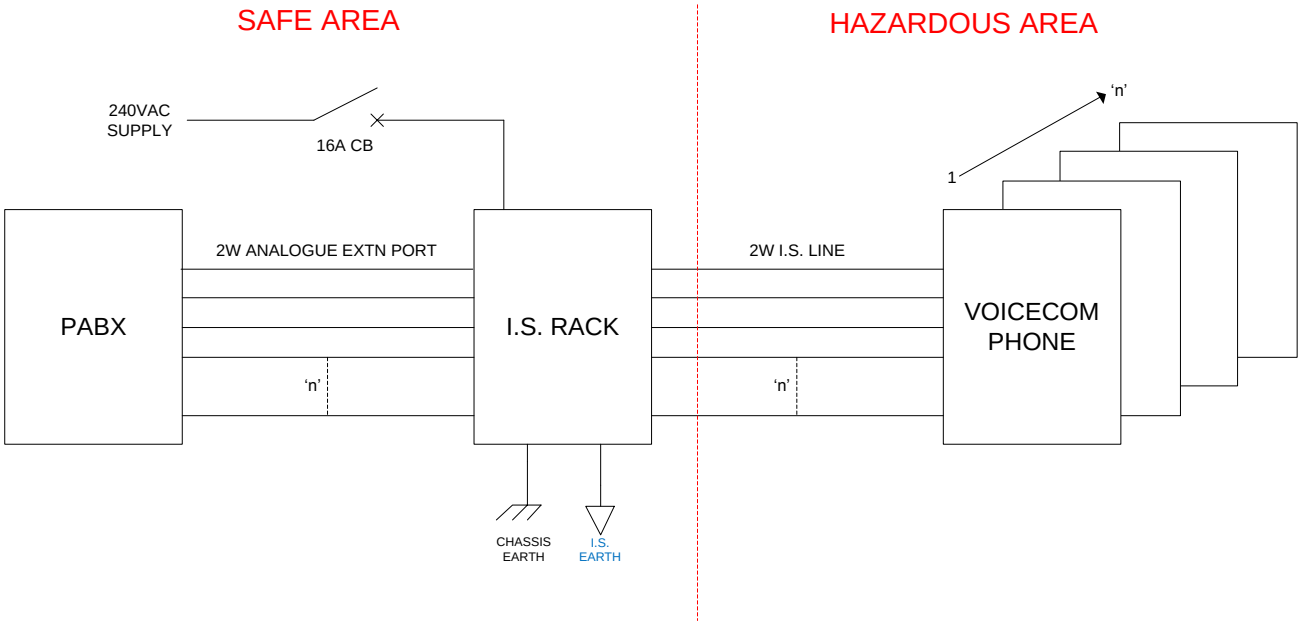


Figure 4: *Interface Cabinet Telephone System*

Note that the I.S. Telephone System requires a site PBX for call functionality. Ampcontrol is able to provide both traditional digital and VoIP PBX solutions; contact Customer Service for enquiries.

3.2 Stand Alone Barrier

This unit comprises of a single Auto-Auto Link Safety Barrier and DC power supply. A power supply of 240VAC 50Hz is required. This configuration allows for only one circuit (that is, one telephone) with no battery backup.

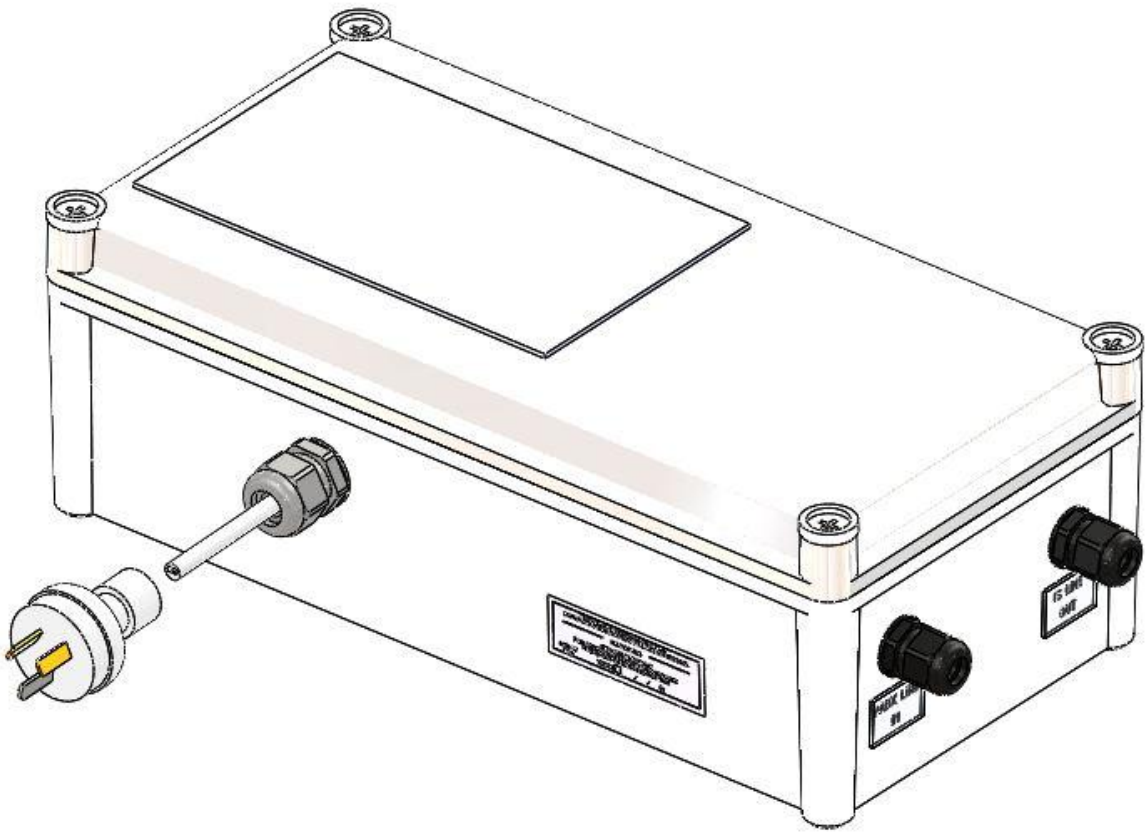


Figure 5: *Single Telephone Stand Alone Barrier*

Figure 6 shows the arrangement for a single telephone circuit using a stand-alone barrier.

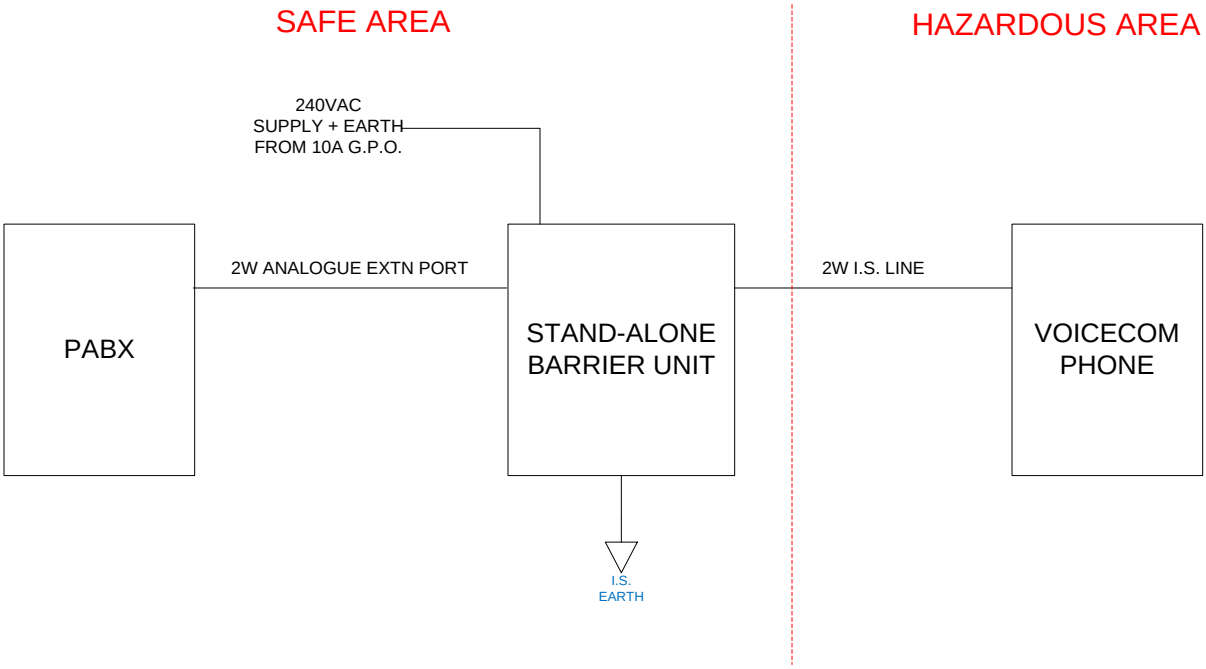


Figure 6: *Single Telephone System*

Note that the I.S. Telephone System requires a site PBX for call functionality. Ampcontrol is able to provide both traditional digital and VoIP PBX solutions; contact Customer Service for enquiries.

NOTE	**I.S. Earth connection on site should be in accordance with AS/NZS60079.25 (Intrinsically safe electrical systems) and AS/NZS60079.14 (Electrical installations design, selection and erection). See Section 12.2.4 of Part 14 for details.**

NOTE	**Clear provision is made for connection of I.S. Earth in both stand-alone and interface cabinet arrangements.**

4 SYSTEM COMPONENTS

4.1 Auto-Auto Links

An Auto-Auto Link is a modular plug-in printed circuit card and is required for each telephone extension.

The Auto-Auto Link provides signal isolation between the safe area telephone equipment and telephone line and the telephone installed in the hazardous area.

The modular printed circuit board plugs in to a standard 19" Rack Eurocard Shelf Kit that accommodates fifteen (15) Auto-Auto Links.

4.1.1 Brief Description

The Auto-Auto Link removes the speech and ring signal from the incoming 24 to 48 Volt analogue telephone line. The speech is re-impressed on the telephone lines to the I.S telephones using the 24VDC supply from the system batteries. Any incoming ring signal is converted to a simple line voltage reversal which appears on the I.S telephone lines. The I.S telephone recognises this line reversal as a ring signal and emits an audible tone to indicate an incoming call.

The off hook signal from the I.S telephones is also detected by the Auto-Auto Link PCB and relayed to the PABX or PSTN line or IP server where ATA's are used.

All signals to and from the I.S telephone lines are via the approved barrier which is mounted on the Auto-Auto Link Shelf kit. The combination of the Auto-Auto Link circuit and the approved barrier creates total electrical isolation and full safety limiting between the PABX/PSTN/IP SERVER telephone lines in the safe area and the I.S telephone lines in the hazardous area.

4.1.2 Operation

The Auto-Auto Link PCB is factory pre-set and requires no field adjustments.

4.2 Intrinsically Safe Barrier

The NB15AC is an intrinsically safe Zener barrier. The barrier is designed to be installed in a safe area, providing an intrinsically safe output which can be used in Group I or IIC hazardous areas, as per certification ANZEx 12.3009X.

The barrier consists of a combination of Zener diodes, power limiting resistors and fuses. These components limit any hazardous power signals through the barrier to a safe level before entering a hazardous area. The barrier provides isolation between the telephone equipment located in a safe area and the telephone installed in the hazardous area.

The NB15AC barrier configuration used in the IS Telephone System is Configuration B.

4.3 Battery Charger

The AC/DC Battery Charger is rack mounted and is installed in the top section of the Interface Cabinet. The Battery Charger is connected directly to the standby batteries and load in a float charge arrangement.

Input supply to the standard Battery Charger is 240V ± 5% and should be protected by a 16A circuit breaker. Output Voltage is 27.6VDC and the Output Current is 5A.

The front fascia of the Battery Charger contains a voltmeter that can be selected to read the battery or load voltage. An ammeter is provided for load current and five (5) LEDs indicate the status of the charger.

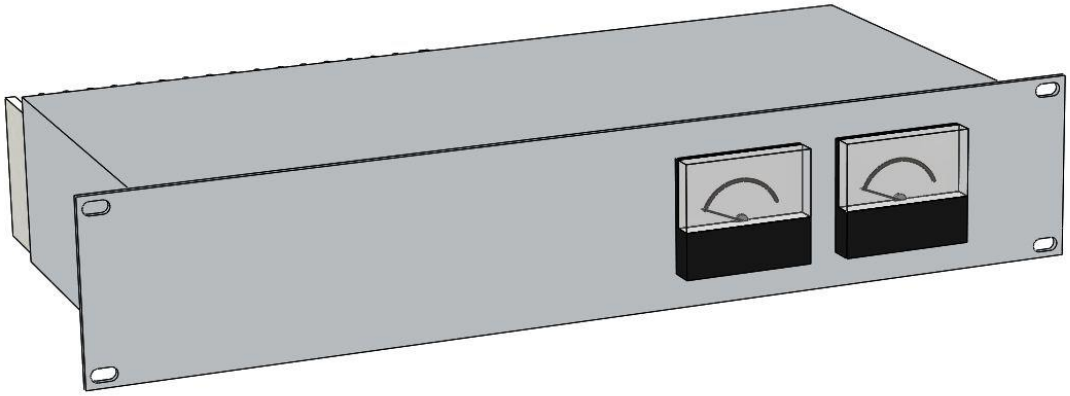


Figure 7: *Rack Mounted AC/DC Battery Charger*

4.3.1 LED Indication

The LED lights indicate the following operating conditions of the Battery Charger:

- DC OK
- BATT OK
- BATT ON-LINE
- BATT STATUS
- OVER TEMPERATURE

4.3.2 Standby Batteries

The Ampere Hour rating of the 24VDC standby battery is dependent on the number of Auto-Auto Links installed and the time telephone communications must be maintained during a power failure.

12V Sealed Gel (no maintenance) batteries are supplied in a nominal 40AHr capacity. The capacity of the battery bank can be increased as required. Discuss individual site requirements with Ampcontrol at the time of order.

4.4 Voicecom Telephone

The Ampcontrol Voicecom Telephone has been designed for use in the coal mining industry. The telephone is Ex ia certified for use in Group I hazardous areas, and provides a reliable solution to suit harsh underground environments. The enclosure is lightweight (<2kg) and IP67 rated.

- Easy installation
- Field-replaceable handset
- IEC certified to Ex ia: IECEx MSC 14.0019X
- Programmable quick-dial numbers
- Optional Push-To-Talk (PTT) for noisy environments
- DTMF and Pulse dialling options

Figure 8: *Voicecom Telephone*

4.4.1 Brief Description

The Voicecom Telephone has been designed to provide a user friendly communications solution. The lightweight design is coupled with an integrated carry handle to allow for easy transport and installation.

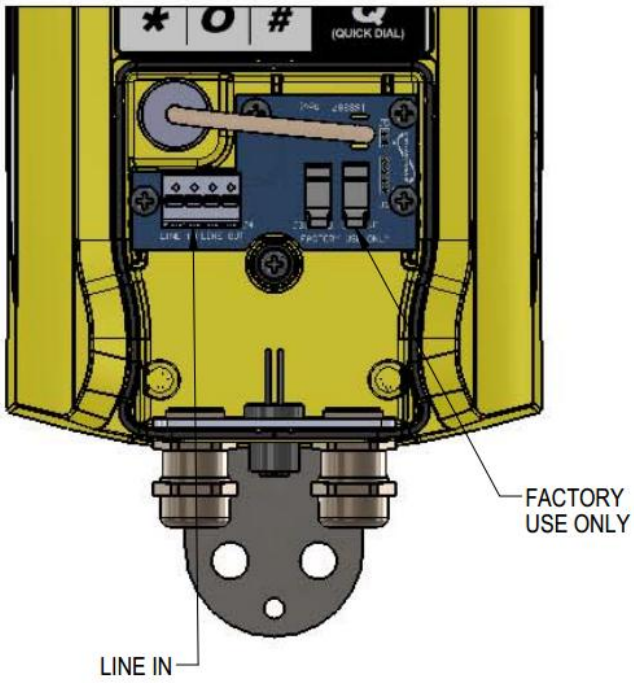
The spring retained handset provides security and reduces the risk of damage, while providing improved portability of the unit. Should the handset be damaged, it may be replaced without the need to remove the telephone from the field.

A 24VDC supply is provided from batteries within the Interface Cabinet to the telephone unit, no battery is required. Up to three (3) Voicecom telephones can be connected in a party line configuration, depending on phone line length and cross-section.

4.4.2 Mounting and Installation

The carry handle is provided with mounting detail to allow for installation of the unit to 24mm rib bolts, or using M5 mounting screws. Mounting loops are provided for general use which can be used for extra mounting or for attaching additional phone information (for example, a phone list).

An integrated terminal compartment allows for simple connection and can be accessed using a single retained hex nut. The cable is terminated through pre-tapped M16 gland entries into spring-cage terminals.



PARTIAL FRONT VIEW WITH TERMINAL COVER REMOVED FOR CLARITY

Figure 9: *Voicecom Telephone's Terminal Compartment*

Power is to be supplied by a suitably rated I.S. barrier – the NB15AC, see Section 4.2.

Connection to be terminated to the LINE IN terminals in the termination compartment.

Connectors labelled FACTORY USE ONLY are not to be used for field termination.

Incoming cable is to be connected via a suitably rated cable gland, and the termination compartment cover to be replaced in service.

If an additional device is to be connected to the same line, the LINE OUT terminals may be used and the outgoing cable connected via a suitably rated cable gland.

4.4.3 Call Operation

The Voicecom Telephone is used in the same manner as a normal telephone. Site procedures will apply to any special cases such as emergencies. Audio and visual notification is provided to signal an incoming call. Adjustable volume control allows configuration for a particular applications.

If the handset remains off-hook for more than 30 minutes, the telephone will automatically hang up.

A programmable emergency call button (programmed by default to 555) is provided. To make an emergency call, press the Emergency Call button (**!**) twice within a two second window.

To dial a stored quick-dial number, the user presses ***Q***, followed by the quick-dial entry required (1-9).

4.4.4 Programmable features

The Voicecom Telephone has a number of user-accessible programmable features. These are:

- Quick-dial number entries on digits 1 through to 9
- Adjustable DTMF levels (to combat signal losses on long telephone lines)
- Selectable tone or pulse dialling

To program a quick-dial number:

1. Pick up handset
2. Dial * # (beep will be heard)
3. Dial 0 0 [key to program]. E.g. 0 0 1 for fast dial entry on key 1, or 0 0 EMERGENCY to change the Emergency dial string
4. Dial * #
5. Enter phone number
6. Dial # (2 beeps will be heard to finish)
7. Replace handset

For example, to dial ‘0249034800’ into quick dial 1:
(pick up handset) * # (beep) 0 0 1 * # 0 2 4 9 0 3 4 8 0 0 # (two beeps) (replace handset)

To program other phone settings:

1. Pick up handset
2. Dial * # (beep will be heard)
3. Dial [dial string] for setting to be adjusted, e.g. 1 0 2 to change dial type
4. Dial * #
5. Dial [dial string] for option selected, e.g. 0 1 for tone dialling
6. Dial # (2 beeps will be heard to finish)
7. Replace handset

Setting		Options	
Desciption	**Dial String**	**Desciption**	**Dial String**
DTMF Levels	101	+6Db on high freq DTMF	01
		All DTMF levels equal	02
Dialling Type	102	Tone	01
		Pulse	02

For example, to set pulse dialling:
(pick up handset) * # (beep) 1 0 2 * # 0 2 # (two beeps) (replace handset)

Any mistake during programming will result in three beeps. The user must hang up to start again.

4.4.5 Certification Details

IECEx MSC 14.0019X
Ex ia I -20°C < T_{amb} < 60°C IP67

Electrical Parameters on Line In terminals:
Ui = 30V
Ii = 200mA
Pi = 1.3W
Ci = neg
Li = neg

See Conditions of Safe Use on certificate in appendix. The device conforms with IEC60079.11, section 6.3.13. All exposed non-metallic surfaces >100cm^2 have a surface resistance complying with IEC60079.0, section 7.4.2. The Voicecom Telephone is suitable for use in Group I environments, with a temperature range -20°C to 60°C.

See the appendix to this user manual for a copy of certificate IECEx MSC 14.0019X

4.5 Intrinsically Safe Indicator (ISI)

The Ampcontrol Intrinsically Safe Indicator (ISI) is an accessory for the I.S. Telephone System. It can be connected to the same line as a Voicecom Telephone, and is used to provide an audible and visual alert to personnel in the area of an incoming ring.

A typical installation for the ISI is in a roadway where a telephone is installed in an adjacent cut-through. When the telephone rings, the alert will be out of line-of-sight of operators. The ISI provides a secondary means of alert so that the call can be answered.

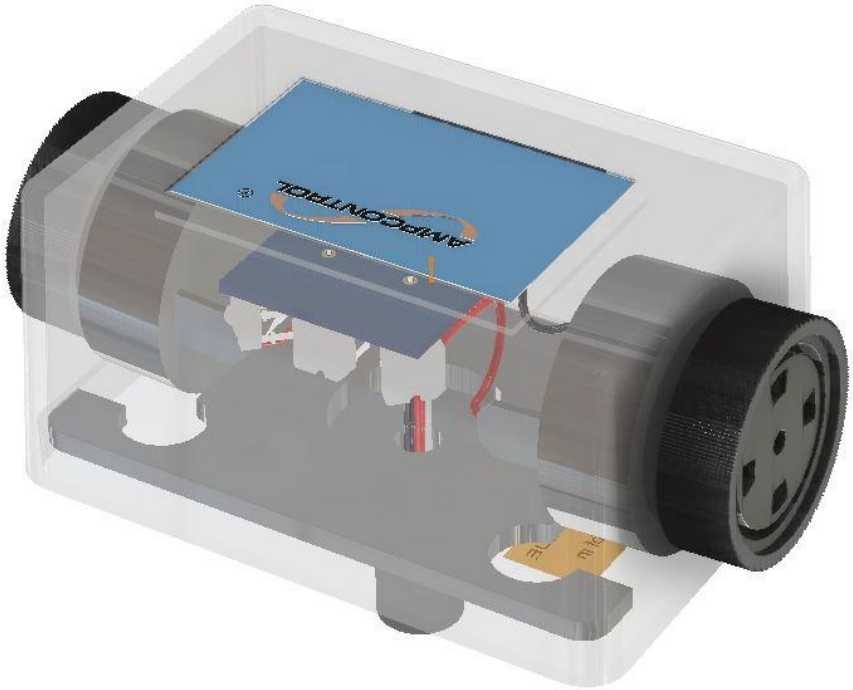


Figure 10: *Intrinsically Safe Indicator (ISI) Unit*

4.5.1 Installation

The ISI can be mounted to any type of enclosure via a threaded mounting sleeve, nylon washer and nut. The nylon washer provides ingress protection into the enclosure, and the ISI itself is encapsulated for environmental sealing. The integral wires of the ISI will be connected to terminals inside an enclosure having a minimum protection rating of IP54.

Power is to be supplied by a suitably rated I.S. barrier – the NB15AC, see Section 4.2. The ISI has flying leads for wiring into terminals. It is possible to select audible alert, visual alert or both audible and visual alert.

4.5.2 Certification Details

IECEx MSC 14.0019X
Ex ia I -20°C < T_{amb} < 60°C IP67

Electrical Parameters on Line In terminals:
Ui = 30V
Ii = 200mA
Pi = 1.3W
Ci = neg
Li = neg

See Conditions of Safe Use on certificate in appendix. The device conforms with IEC60079.11, section 6.3.13. There are no user serviceable parts. For repairs or decommissioning, return to the manufacturer. The ISI is suitable for use in Group I environments, with a temperature range -20°C to 60°C.

See the appendix to this user manual for a copy of certificate IECEx MSC 14.0019X.

5 INSTALLATION

5.1 General Warnings

These instructions have been designed to assist users of the Intrinsically Safe Telephone System with installation.

Before the telephone can be installed, there are a number of things that need to be considered and understood to prevent incorrect or unsafe operation of the telephone or the system into which it is installed.

Along with relevant competence, and an understanding of the target application, the following points should be considered:

5.1.1 Ensure that the information provided in this user manual is fully understood.

It is extremely important that the limitations and functionality of the I.S Telephone System are understood to prevent incorrect installation and use from creating a potentially dangerous risk. If in doubt as to the nature of the limitations or their implication, consult a competent authority such as a supervisor or Ampcontrol technical representative.

5.1.2 Ensure that the application into which the telephone is being installed has been properly defined, designed and approved.

Any critical communications system needs to be properly designed and implemented. Such a system must be the result of structured risk analysis with the outcomes used to define the system requirements. These requirements, in turn, will guide the choice of equipment needed to implement the system. Understanding the needs of the system will ensure proper selection of equipment.

5.1.3 Ensure that the I.S Telephone System will properly perform the required functions within the system design.

It is important to understand how the telephone is intended to interact with other equipment within a system. For safe and reliable use, it is crucial that neither the system's logical operation nor its signalling be compromised by incompatibilities with connected equipment.

5.1.4 Modifications of any form to the I.S Telephone are prohibited.

The telephone as supplied has been designed and manufactured to comply with the applicable standards. If modifications of any form are made to the telephone, the equipment may no longer be fit for use. If any modifications or damage to the telephone is evident, do not use the equipment and contact Ampcontrol for advice.

5.2 Mandatory Installation Practices

The following information must be adhered to when installing the I.S Telephone System. Failure to adhere to this information may give rise to unsafe operation.

Using the telephone in a manner that exceeds its electrical, functional or physical specifications, or in a way that is contrary to its operating restrictions, may create risks to personnel and/or equipment resulting in injury or death.

1. Ensure that the I.S. Earth connection is correctly installed as per AS/NZS 60079.14.
2. The telephone must be powered by an Ampcontrol supplied Interface Cabinet or Stand-Alone barrier.
3. The installation of the telephone must be carried out by suitably trained and qualified personnel.
4. Certification and identification labels fixed to the telephone must not be damaged, removed or covered before, during or after installation.
5. The supply to an installed I.S. Rack must be protected by a 16A circuit breaker. Any installed Stand-Alone barriers must be supplied from a standard 10A G.P.O.
6. The installation is to be in accordance with the relevant installation Standards/Codes of Practice.
7. Modifications must not be made to any part of the telephone. As supplied, the unit is built to, and complies with the relevant standards. Modifications to its construction will render the unit incompatible with its certification.
8. Complete and accurate records of the installation must be kept as part of the site installation.

5.3 Cable Considerations

5.3.1 Safe Area Telephone Lines

A standard multicore telephone cable connects the Interface Cabinet Safe Area Krone Connection block to the PABX. Connections to the cabinet from the PBX are affected on these Krone connections.

5.3.2 Hazardous Area Cable Selection

Ampcontrol can supply telephone cable suitable for deployment with the I.S telephone system. Where cables are to be sourced elsewhere, Ampcontrol recommends the use of AS/ACIF S008, AS/NZS 2381.7 compliant cable to maximise audio performance. Ampcontrol recommends the use of 0.90mm cable to minimise voltage drop to the telephone. Individual shielding of each pair is required by AS/NZS 2381, and is recommended to mitigate electrical interference from other systems.

At the user's discretion, Type B cable in accordance with AS/NZS 60079 may be used if non-individually screened cable is required.

5.3.3 Hazardous Area Cable Installation

The cable connecting the Auto-Auto Link Barrier to the I.S telephone, through the hazardous area, must not exceed the parameters listed in the Certificate of Conformity (ANZEx 06.3042X). The telephone system must also be compliant with the requirements of AS/ACIF S008 - Requirements for Customer Cabling Products.

The cable should be installed such that the impedance is minimised, and to reduce the effect of noise on the system the cable shielding should be earthed at the Head End only. It is important that the following installation practice be followed:

- Shields earthed to the chassis earth in one location only, at the I.S phone rack.
- Shields not connected together except for the point of earth connection
- Shields continuous all the way to the telephone

It is helpful to treat the shield on an individually screened telephone pair as the third conductor for each

telephone service; it is to be properly carried through to the telephone and not cross connected with any other signal.

Unused cores must be earthed. This earth should come from the head-end equipment earth to minimise interference. This may be achieved by carrying an earth signal from the head end on a pair of conductors in the cable bundle.

	It is the responsibility of the end user to audit the telephone system installation to ensure compliance with I.S. requirements.

CAUTION!	**For a cable containing Intrinsically Safe circuits, non-I.S circuits must NOT be run in the same cable.**

6 SERVICE, MAINTENANCE & DISPOSAL

6.1 Equipment Service

If a handset is damaged, a replacement may be obtained from the manufacturer. See the Conditions of Safe Use for details. Otherwise, there are no user serviceable parts. For repairs or decommissioning, return to the manufacturer.

A number of external system based checks should however be completed on a regular basis. These 'routine inspections' must be carried out by suitably trained people with knowledge of the telephone and the systems into which it is fitted. Routine inspections may take the form of either visual-only checks, or visual and 'hands-on' checks.

6.1.1 Visual Only Inspections

A basic visual inspection focuses on looking at the installation for signs of physical damage, water or dust ingress and the condition of cables and labels.

Observations would typically be:

1. Check that equipment enclosures, cable trays, conduits, etc. are in good order with no physical damage.
2. Check that connected cables are free from cuts, abrasions and obvious signs of damage. Cable restraints are in good order and correctly fitted.
3. Check that labels on equipment, wall boxes and cables are present and in good condition (especially certification labels).
4. Check that no modifications have been carried out to installed equipment.

6.1.2 Hands-On (Detailed) Inspections

A more detailed inspection would include all of the elements of a visual inspection, plus some checks that cover the integrity of connections, fixtures and fittings.

In addition to basic visual observations, more detailed integrity checks would involve:

5. Verify that equipment housings, wall boxes and other mechanical fixtures are secured in place. This includes terminal box lids, tightness of cable glands, integrity of wall-box mountings, security of equipment fixing to walls/DIN rails etc.
6. Verify all electrical connections are secure with no loose screw terminals or DIN rail terminals not fitted to rails etc. Particular attention is to be paid to the I.S. Earth connections.
7. Verify operation of the telephone by making and receiving calls; confirm that voice communication is clear.
8. Refer to site procedures regarding the testing of the emergency call functionality.
9. For interface cabinets equipped with battery chargers with diagnostic capability, regular (minimum 12 monthly) checks on battery health are recommended. Otherwise, it is recommended that the batteries be replaced every five years.

6.2 Equipment Maintenance

WARNING!	**The Intrinsically Safe Telephone System has no user-serviceable parts. All repairs must be carried out by Ampcontrol only. If a fault develops, return to Ampcontrol for repair. It is essential that no attempt be made to repair the telephone as any attempt to dismantle or repair the telephone can seriously compromise the safety of the unit.**

6.3 Disposal

	The electronic equipment discussed in this manual must not be treated as general waste. By ensuring that this product is disposed of correctly you will be helping to prevent potentially negative consequences for the environment which could otherwise be caused by incorrect waste handling of this product.

7 SPECIFICATIONS

7.1 Interface Cabinet and Batteries

General	
Input Voltage	240VAC ± 5% at full output current, 50Hz
Output Voltage to Batteries	27.6VDC (24VDC)
Output Current	5A
Cable Requirements	Refer to Section 5 for details

7.2 Barrier

General	
Certification	ANZEx 12.3009X

I.S. Parameters								
Connection Method	***Maximum V & I***		***Group IIC (Maximum)***			***Group I (Maximum)***		
	Uo	*Io*	*Co*	*Lo*	*Lo/Ro*	*Co*	*Lo*	*Lo/Ro*
Configuration - B	30V	66mA	44nF	40µH	4µH/Ω	1.5µF	2.0mH	15µH/Ω

7.3 Voicecom Telephone

General	
Certification	IECEx MSC 14.0019X
Operating Current	3.5 - 9.5mA
Ringing Volume	85dB @ 3’
Operating Temperature	-20 - 60°C
Humidity	0 - 90%, non-condensing

I.S. Parameters		
Maximum Input Voltage	Ui	30V
Maximum Input Current	Ii	200mA
Maximum Input Power	Pi	1.3W
Maximum Internal Capacitance	Ci	Negligible
Maximum Internal Inductance	Li	Negligible

Outputs	
Keypad	Dimple on “5” and “Emergency” buttons
Indication	Yellow Ringing LEDs
Compliances	IEC 60079.0 IEC 60079.11 ETR 051 ITU-T P350 ITU-T E161

Mechanical	
Dimensions (HxWxD)	404x145x102mm
Ingress Protection	IP67

7.4 Intrinsically Safe Indicator (ISI)

General	
Certification	IECEx MSC 14.0019X
Operating Current	5mA
Ringing Volume	85dB @ 3’
Operating Temperature	-20 - 60°C
Humidity	0 - 90%, non-condensing

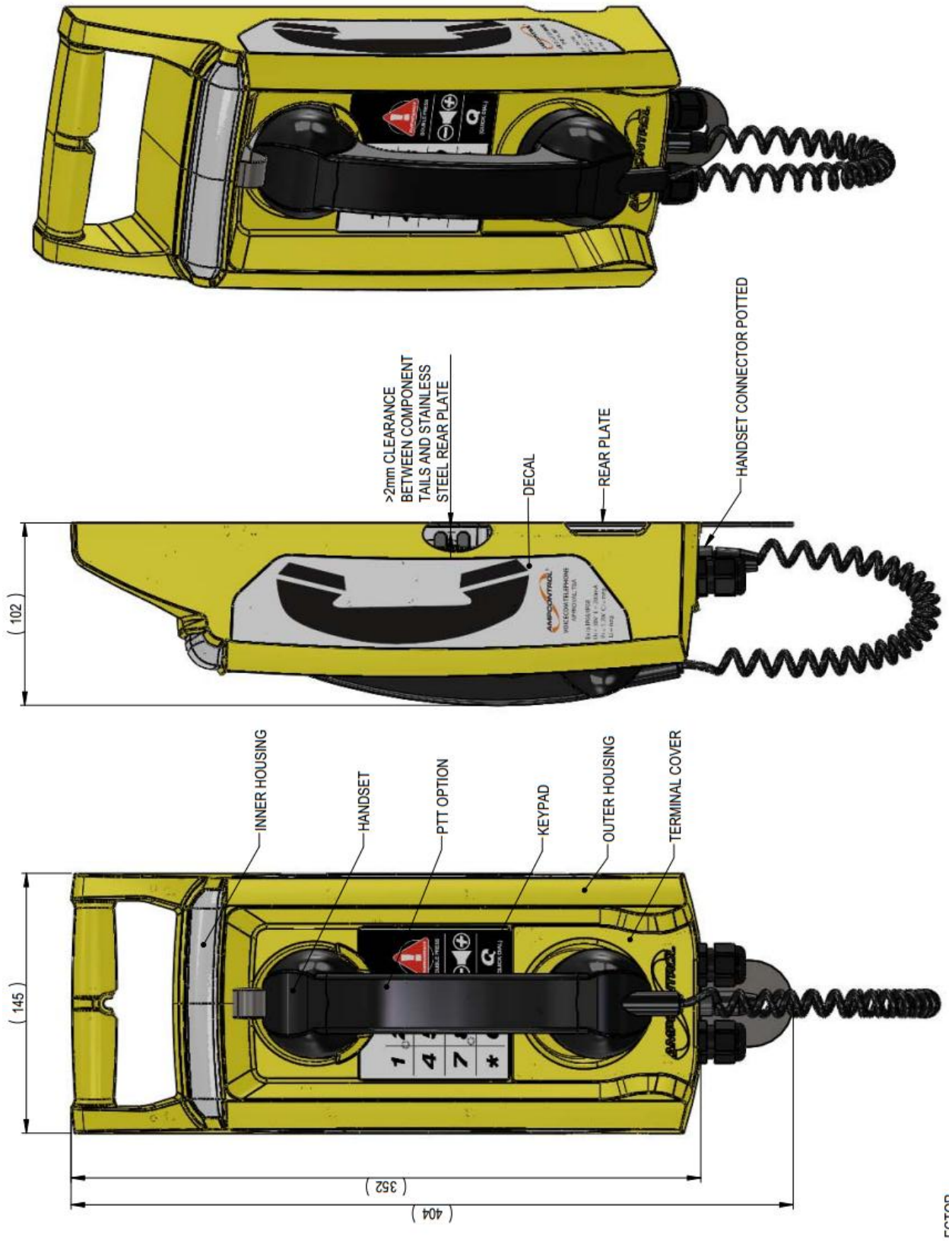
I.S. Parameters		
Maximum Input Voltage	Ui	30V
Maximum Input Current	Ii	200mA
Maximum Input Power	Pi	1.3W
Maximum Internal Capacitance	Ci	Negligible
Maximum Internal Inductance	Li	Negligible

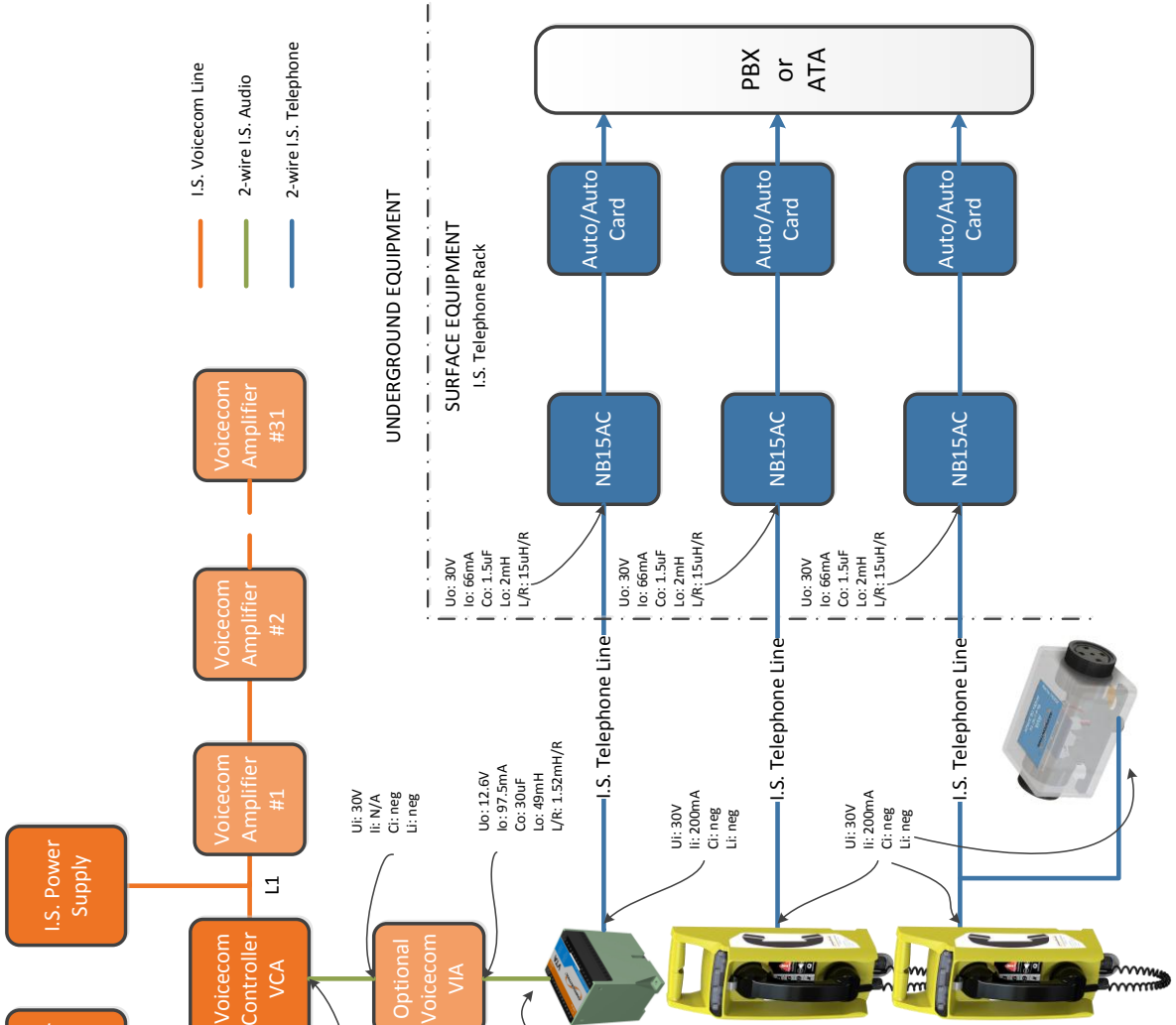
Mechanical	
Dimensions (HxWxD)	45x115x61mm
Ingress Protection	IP55 to be mounted on a minimum IP54 enclosure

8 EQUIPMENT LIST

Part Number	*Description*
169890	TELEPHONE VOICECOM WITH NORMAL HANDSET
169893	TELEPHONE VOICECOM WITH PTT HANDSET
142036	AUTO AUTO LINK V6 NO BARRIER
117675	BARRIER NB15AC
170364	REPLACEMENT HANDSET FOR VOICECOM TELEPHONE
170365	REPLACEMENT PTT HANDSET FOR VOICECOM TELEPHONE
172639	REPLACEMENT TERMINAL COVER AND O-RINGS
173203	MODULE TELEPHONE VCOM A/V ALARM ISI

APPENDIX A
DRAWINGS


>2mm CLEARANCE BETWEEN COMPONENT TAILS AND STAINLESS STEEL REAR PLATE
DECAL
REAR PLATE
HANDSET CONNECTOR POTTED
(102)
INNER HOUSING
HANDSET
PTT OPTION
KEYPAD
OUTER HOUSING
TERMINAL COVER
(145)
(352)
(404)



Cable Calculations

I.S. Telephone Line
C_{CABLE} = Co – Ci = 1.5uF
Li = neg, so L/R may be used

Typical cable has L/R < 15uH and C = 50nF/km
L/R of barrier = 15uH, so cable not limited by inductance
Cable length = 30km based on 1.5uF ÷ 50nF/km

VCA-VIA Audio (where VIA is used)
C_{CABLE} = Co – Ci = 1.8uF
L_{CABLE} = Lo – Li = 38mH

VIA must be installed in a safe area. Recommend co-locating with VCA.

VIA-VTA Audio (where VIA is used)
C_{CABLE} = Co – Ci = 28.4uF
Li = neg, so L/R may be used for assessment

Typical cable has L/R < 15uH and C = 50nF/km
L/R of barrier = 15uH, so cable not limited by inductance
Cable length > 500km based on 28.4uF ÷ 50nF/km

VCA-VTA Audio (where VIA is omitted)
C_{CABLE} = Co – Ci = 200nF
L_{CABLE} = Lo – Li = 38mH

Typical cable has L = 0.8mH/km and C = 50nF/km
38mH ÷ 0.8mH/km = 47.5km
200nF ÷ 50nF/km = 4km
Therefore maximum distance between VCA and VTA = 4km

Notes

Cable values shown above are typical values only, and are provided as indicative.

Installation to be undertaken by "competent persons" as defined in AS/NZS/IEC 2381.7/ 60079.14. Installation must comply with any site specific requirements or regulations as well as hazardous area installation standards including but not limited to: AS/NZS/IEC 2381.1, 60079.1, 2381.7, 60079.14 and 4871. Due consideration shall also be given to any special conditions of safe use listed in the certificates of components (such as ISI to be installed on an IP54 rated enclosure).

APPENDIX B
CERTIFICATIONS

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.:	IECEx MSC 14.0019X	Issue No: 0	Certificate history: Issue No. 0 (2014-12-19)
Status:	**Current**	Page 1 of 4	
Date of Issue:	**2014-12-19**		
Applicant:	**Ampcontrol CSM Pty Ltd** 7 Billbrook Close Cameron Park NSW 2285 **Australia**		
Electrical Apparatus:	**VOICECOM Telephone, Voicecom Telephone Adapter (VTA), IS2000 Telephone, Intrinsically Safe Indicator (IS3000 ISI)**		
Optional accessory:	*None.*		
Type of Protection:	**Intrinsic Safety**		
Marking:	Ex ia I Ma **-20°C ≤ Ta ≤ 60°C**		

Approved for issue on behalf of the IECEx Certification Body: Geoff Slater

Position: Quality and Certification Manager

Signature:
(for printed version)

Date: 19/12/2014.

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

MSTC Mine Safety Technology Centre
8 Hartley Drive
Thornton NSW 2322
PO Box 343
Hunter Region Mail Centre NSW 2310
Australia

NSW GOVERNMENT Trade & Investment Mine Safety

IECEx Certificate of Conformity

Certificate No:	IECEx MSC 14.0019X	Issue No: 0
Date of Issue:	**2014-12-19**	Page 2 of 4
Manufacturer:	**Ampcontrol CSM Pty Ltd** 7 Billbrook Close Cameron Park NSW 2285 **Australia**	
Additional Manufacturing location(s):		

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:

The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2011 Edition:6.0	Explosive atmospheres - Part 0: General requirements
IEC 60079-11 : 2011 Edition:6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:

AU/MSC/ExTR14.0013/00

Quality Assessment Report:

AU/TSA/QAR06.0007/06

IECEx Certificate of Conformity

Certificate No: IECEx MSC 14.0019X Issue No: 0

Date of Issue: **2014-12-19** Page 3 of 4

Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

There are four product covered in this test report;

1. **VOICECOM Telephone (Injection-molded enclosure- Plastic)**

This enclosure is fitted with a hand set and keypad. The Terminal Board (Artwork drawing NACP008) is mounted inside a separate compartment from the IS3000 Main PCB (NACP166), Piezo Board (NACP010) and LED Board (NACP009). The steel plate is attached to the back of the enclosure. The equipment is not handheld and the handle is only utilized for mounting.

1. **VTA- Voicecom Telephone Adapter (Using ERNI enclosure)**

This plastic enclosure is fitted with IS3000 Main PCB only. The input output terminals are on the front upper part of the enclosure. This equipment is rail mounted and should be installed inside an enclosure of at least IP 54.

1. **IS2000 Telephone (Using IS2000 Telephone enclosure –Metal)**

There are two versions of enclosures that are used. They are identified as hooded and door versions in the scheduled drawings NACA139. They are fitted with a keypad and a hand set. The Audio Visual Alarm (AVA), (NACP002) or alternatively, Alarm Light (NAC1006) and Piezo board (NACP010) can be fitted to either of two enclosures. These arrangements are as per drawing number NACA139. The enclosure of the handset is made out of plastic. The enclosures of Audio Visual Alarm and Alarm Light are also plastic. A mounting handle is attached to the back of this metal enclosure.

1. **Intrinsically Safe Indicator (IS3000 ISI)**

The Intrinsically Safe Indicator (ISI) is in a plastic enclosure, which has all of the internal components encapsulated. The ISI mounts on to host enclosure via a threaded mounting sleeve, nylon washer and nut. It is fitted with LEDs, Piezo buzzers, resistors and diodes only. It has wires protruding from the mounting sleeve, which connect to terminals in the separate enclosure.

CONDITIONS OF CERTIFICATION: YES as shown below:

Refere the attached Annex.

IECEx Certificate of Conformity

Certificate No:	IECEx MSC 14.0019X	Issue No: 0
Date of Issue:	**2014-12-19**	Page 4 of 4

Additional information:

Refere the attached Annex.

Annex:

Annex of IECEx MSC14.0019X-00.pdf

IECEx Certificate of Conformity Annex

Annex for Certificate No.: IECEx MSC 14.0019X Issue No: 0

Conditions of certification pertaining to Issue 0 of this Certificate:

It is a condition of safe use that the following parameters are taken into account during any installation:

1. IS2000 Telephone;
Terminals LINE IN
Ui = 30 V
Ii = 200 mA
Pi = 1.3 W
Ci = Negligible
Li = Negligible

2. VOICECOM Telephone;
Terminals LINE IN
Ui = 30 V
Ii = 200 mA
Pi = 1.3 W
Ci = Negligible
Li = Negligible

3. VOICECOM Telephone Adaptor (VTA);
Terminals LINE IN
Ui = 30 V
Ii = 200 mA
Pi = 1.3 W
Ci = Negligible
Li = Negligible

Terminals VOICECOM CONNECTION
Ui = 12.6 V
Ii = 100 mA
Ci = 1.60 µF
Li = Negligible

4. Intrinsically Safe Indicator (ISI):

Ui = 30 V
Ii = 200 mA
Pi = 1.3 W
Ci = Negligible
Li = Negligible

It is a condition of safe use that the VOICECOM Telephone Adaptor (VTA) must be mounted inside a host enclosure with minimum IP54.

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NSW GOVERNMENT Trade & Investment Mine Safety
Mine Safety Technology Centre

CP17 Page 1 of 4

IECEx Certificate of Conformity Annex

Annex for Certificate No.: IECEx MSC 14.0019X Issue No: 0

Drawing list pertaining to issue 0 of this certificate:

Manufacturer's Documents				
Drawing/Document Number:	Page/s:	Title:	Revision Level:	Date: (yyyy-mm-dd)
NACZ127	1	Telephone VOICECOM IS2000, ISI, VOICECOM & VTA Label Detail	0	2014-11-19
NACA138	2	VOICECOM TELEPHONE Mechanical Certification Details	3	2014-10-22
NACA139	2	NAC IS2000 Telephone IECEx General Arrangement	1	2014-08-22
NACA140	1	Voicecom Telephone VTA Module Certification Drawing	1	2014-08-22
NACA141	1	Voicecom Telephone IP rating Sealing Details	2	2014-10-02
NACA144	1	VOICECOM TELEPHONE IS2000, VCOM TELEPHONE, VTA Filed Terminations	0	2014-08-22
NAC-M-084	1	Communications Weatherphones FASCIA Gasket –E10280 Manufacturing Details	1	2008-10-22
NACM158	2	Communications IS 2000 Phone Gland Plate Gasket Manufacturing Details	0	2012-04-19
		ISI MODULE		
NACZ120	1	NAC AVA IS3000 & ISI Module Certification Details	3	2014-11-28
NACE 167	1	VCOM IS3000 Intrinsically Safe Indicator Schematic	2	2014-11-28
NACB167	1	IS3000 Intrinsically Safe Indicator	2	2014-11-28
NACP167	5	VCOM IS3000 Intrinsically Safe Indicator	2	2014-11-28
		ALARM LIGHT		
NAC-A-048	1	NACOM 24 V DC IS Mining PHONE LED and P.C.B Assembly P/N E05779 Assembly Drawing	2	1995-05-21
NAC1006	1	ALERT LIGHT (NIS-L) For Intrinsically Safe Phone	1	1992-02-18
		AUDIO VISUAL ALARM		
NACE046	1	NAC Audio Visual Alarm Subassembly Schematic	6	2014-11-27
NACP002	3	NAC Audio Visual Alarm	1	2014-11-28

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IECEx Certificate of Conformity Annex

Annex for Certificate No.: IECEx MSC 14.0019X Issue No: 0

Manufacturer's Documents				
Drawing/Document Number:	Page/s:	Title:	Revision Level:	Date: (yyyy-mm-dd)
		LED BOARD		
NACE067	1	VOICECom Phone LED board Vertical Mount	2	2014-10-02
NACP009	5	VOICECom Phone LED board Vertical Mount (PCB Artwork)	2	2014-10-02
NACB020	1	VOICECom Phone LED board Vertical Mount (BOM)	2	2014-10-02
		Terminal Board VOICECOM		
NACE066	1	VoiceCom Phone Terminal Board (Schematic)	1	2014-10-02
NACP008	5	VoiceCom Phone Terminal Board	2	2014-10-02
NACB019	1	VoiceCom Phone Terminal Board (BOM)	1	2014-10-02
		PIEZO BOARD VOICECOM		
NACE068	1	VoiceCom Phone Piezo board (schematic)	3	2014-12-17
NACP010	4	VoiceCom Phone Piezo board (PCB)	3	2014-11-27
NACB021	1	VoiceCom Phone Piezo board (BOM)	2	2014-11-27
		IS3000 MAIN BOARD		
NACE166	Sheet 1 of 4	IS3000 IS Phone Main Schematic Diagram	7	2014-11-26
NACE166	Sheet 2 of 4	IS 3000 Line Interface Schematic Diagram	7	2014-11-26
NACE166	Sheet 3 of 4	IS 3000 2W-4W Audio Interface Schematic Diagram	7	2014-11-26
NACE166	Sheet 4 of 4	IS 3000 Digital Controller Interface Schematic Diagram	7	2014-11-26
NACB166	3	IS 3000 IS Phone Main (BOM)	7	2014-11-26
NACP166	8	IS 3000 Main Board	6	2014-10-09

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IECEx Certificate of Conformity Annex

Annex for Certificate No.: IECEx MSC 14.0019X Issue No: 0

Manufacturer's Documents				
Drawing/Document Number:	Page/s:	Title:	Revision Level:	Date: (yyyy-mm-dd)
		IS3000 Reed Switch		
NACE074	1	IS3000 Reed Switch Board (Schematic)	2	2014-10-09
NACP012	5	IS3000 Reed Switch Board (Art work)	1	2014-10-02
NACB023	1	Reed Switch Board (Bill of Materials)	2	2014-10-10

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Australian/New Zealand
Certification Scheme for
EXPLOSION-PROTECTED ELECTRICAL EQUIPMENT
ANZEx Scheme

Certificate of Conformity

Certificate No.: **ANZEx 12.3009X**	Issue No.: **0**	Date of Issue: **2012-07-25**

Applicant: Ampcontrol CSM Pty Ltd.
7 Billbrooke Close, Cameron Park,
Newcastle, NSW 2285
Australia

Electrical Apparatus: Shunt Diode Safety Barrier

Type of Protection: [Ex ia] I, [Ex ia] IIC

Marking Code: [Ex ia] I (Ta = 45 °C)
[Ex ia] IIC (Ta = 45 °C)

Manufacturer: Ampcontrol CSM Pty Ltd.
7 Billbrooke Close, Cameron Park,
Newcastle, NSW 2285
Australia

Manufacturing Location(s): As above

The EPEE certification database located at ***http://www.anzex.com.au*** *shows the validity of this Certificate.*

Test Safe AUSTRALIA

Certificate issued by:

TestSafe Australia
919 Londonderry Road, Londonderry NSW 2753
Australia
Phone: +61 2 4724 4900 *Fax: +61 2 4724 4999*
http://www.testsafe.com.au

JAS-ANZ
www.jas-anz.org/register

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Australian/New Zealand
Certification Scheme for
EXPLOSION-PROTECTED ELECTRICAL EQUIPMENT
ANZEx Scheme

Certificate of Conformity

Certificate No.: **ANZEx 12.3009X**	Issue No.: **0**	Date of Issue: **2012-07-25**

*This certificate is granted subject to the conditions as set out in Standards Australia/Standards New Zealand Miscellaneous Publication **MP87.1:2008**.*

STANDARDS:

The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

AS/NZS 60079.0:2005	Electrical apparatus for explosive gas atmospheres – Part 0: General requirements (including Amendment 1)
AS/NZS 60079.11:2006	Explosive atmospheres – Part 11: Equipment protection by Intrinsic safety 'i'
AS 60529:2004	Degree of protection provided by enclosures (IP code)

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standard(s) listed above.*

ASSESSMENT & TEST REPORTS:

The equipment listed has successfully met the assessment and test requirements as recorded in:

Test Report No. and Issuing Body:	**33188, TestSafe Australia**
Quality Assessment Report No. and Issuing Body:	**06.002/2012, TestSafe Australia**
File Reference:	**2011/015606**

Ujen Singh
Signed for and on behalf of issuing body

2012-07-25
Date of Issue

Quality & Certification Manager
Position

This certificate is not transferable and remains the property of the issuing body and must be returned in the event of it being revoked or not renewed.

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Australian/New Zealand
Certification Scheme for
EXPLOSION-PROTECTED ELECTRICAL EQUIPMENT
ANZEx Scheme

Certificate of Conformity

Certificate No.: ANZEx 12.3009X Issue No.: 0 Date of Issue: 2012-07-25

Schedule

EQUIPMENT:

The Shunt Diode Safety Barrier is an associated apparatus working in safe area. It is a 2-channel non-polarized shunt diode barrier. It has four models, the NB15AC, NB8.5AC, NB7.14AC and NB5.88AC with different maximum output voltages.

CONDITIONS OF CERTIFICATION:

(1) It is a condition of safe use that the following parameters shall be taken into account during installation:

All models

Input Parameters	Safe Area Terminals
Maximum Supply Voltage U_m	250 V

Model NB15AC

Connection Method			Group IIC			Group I		
	Uo	Io	Co	Lo	Lo/Ro	Co	Lo	Lo/Ro
Configuration A	15 V	66 mA	0.6µF	67µH	12µH/Ω	2.0µF	6.0mH	90µH/Ω
Configuration B	30 V	66 mA	44nF	40µH	4µH/Ω	1.5µF	2.0mH	15µH/Ω
Configuration C	15 V	131 mA	0.6µF	37µH	6µH/Ω	2.0µF	1.5mH	50µH/Ω

Model NB8.5AC

Connection Method			Group IIC			Group I		
	Uo	Io	Co	Lo	Lo/Ro	Co	Lo	Lo/Ro
Configuration A	8.5V	66mA	0.6µF	67µH	12µH/Ω	2.0µF	6.0mH	90µH/Ω
Configuration B	19V	66mA	44nF	40µH	4µH/Ω	1.5µF	2.0mH	15µH/Ω
Configuration C	8.5V	131mA	0.6µF	37µH	6µH/Ω	2.0µF	1.5mH	50µH/Ω

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Australian/New Zealand
Certification Scheme for
EXPLOSION-PROTECTED ELECTRICAL EQUIPMENT
ANZEx Scheme

Certificate of Conformity

Certificate No.: **ANZEx 12.3009X** Issue No.: **0** Date of Issue: **2012-07-25**

Model NB7.14AC

Connection Method			Group IIC			Group I		
	Uo	Io	Co	Lo	Lo/Ro	Co	Lo	Lo/Ro
Configuration A	7.14V	66mA	0.6µF	67µH	12µH/Ω	2.0µF	6.0mH	90µH/Ω
Configuration B	14.3V	66mA	44nF	40µH	4µH/Ω	1.5µF	2.0mH	15µH/Ω
Configuration C	7.14V	131mA	0.6µF	37µH	6µH/Ω	2.0µF	1.5mH	50µH/Ω

Model NB5.88AC

Connection Method			Group IIC			Group I		
	Uo	Io	Co	Lo	Lo/Ro	Co	Lo	Lo/Ro
Configuration B	7.14V	66mA	44nF	40µH	4µH/Ω	1.5µF	2.0mH	15µH/Ω

Configuration A: Channels connected as single channel barriers, between (A or B) and (earth).

Configuration B: Channels connected between (A) and (B).

Configuration C: Channels connected between (shorted A-B) and (earth).

Note: (A) and (B) are the two connections at the output of the barrier.

(2) The model NB5.88AC shall only be connected in Configuration B.

(3) Where the barrier is to be supplied from the mains supply, this shall be supplied from a double-wound transformer that is protected by a fuse or a circuit breaker capable of interrupting the prospective short circuit current of 1500 A.

(4) The clearance between the intrinsically safe output terminals of two barriers mounted next to one another shall be at least 6 mm.

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Australian/New Zealand
Certification Scheme for
EXPLOSION-PROTECTED ELECTRICAL EQUIPMENT
ANZEx Scheme

Certificate of Conformity

Certificate No.: **ANZEx 12.3009X** Issue No.: **0** Date of Issue: **2012-07-25**

DOCUMENTS:

Document No.	Sheets	Document Title	Issue	Date (yyyy-mm-dd)
		Model NB15AC		
NACE050	1	NB15AC Safety Barrier Schematic	7	2012-07-16
NACB011	1	NB15AC Safety Barrier BOM	7	2012-07-16
NACP007	4	NB15AC Safety Barrier PCB (common PCB artwork for all models)	6	2012-07-05
NACZ014	1	NB15AC Safety Barrier Assembly (common assembly drawing for all models)	7	2012-07-16
NACZ019	1	NB15AC Safety Barrier Label	6	2012-05-18
		Model NB8.5AC		
NACE052	1	NB8.5AC Safety Barrier Schematic	7	2012-07-16
NACB012	1	NB8.5AC Safety Barrier BOM	7	2012-07-16
NACZ021	1	NB8.5AC Safety Barrier Label	3	2012-05-18
		Model NB7.14AC		
NACE058	1	NB7.14AC Safety Barrier Schematic	7	2012-07-16
NACB015	1	NB7.14AC Safety Barrier BOM	7	2012-07-16
NACZ121	1	NB7.14AC Safety Barrier Label	0	2012-07-05
		Model NB5.88AC		
NACE061	1	NB5.88AC Safety Barrier Schematic	7	2012-07-16
NACB016	1	NB5.88AC Safety Barrier BOM	7	2012-07-16
NACZ122	1	NB5.88AC Safety Barrier Label	0	2012-07-16

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